Virtual Firefighter Training

Firefighter Training in a Fully Immersive Environment
AFRL/MLQC

THE PROBLEM

DoD fire service organizations conduct academic and practical training sessions. This training gives emergency forces the skills and abilities necessary to implement fire suppression actions, perform rescue operations, mitigate hazardous materials incidents, and conduct emergency medical treatment. Academic training is accomplished through the use of a myriad of teaching options (*e.g* , classroom lecture, films, interactive video, CD-ROM, etc.).

Such training provides the firefighter with an extensive knowledge base. As an emergency situation develops, a firefighter can draw from this knowledge and translate it into an envisioned action plan. Practical training is accomplished by performing the actions to be executed during an actual fire incident. These exercises are pre-briefed, designed to maximize learning outcomes, and monitored to ensure personnel safety. However, during an actual fire emergency the preconceived plan may lead to disaster.

Future firefighters need to be prepared for the numerous and potentially dangerous situations they will encounter during a career. The need exists to exploit and leverage on the adaptation and development of fully immersive virtual environments (virtual reality) into the next generation of training systems.

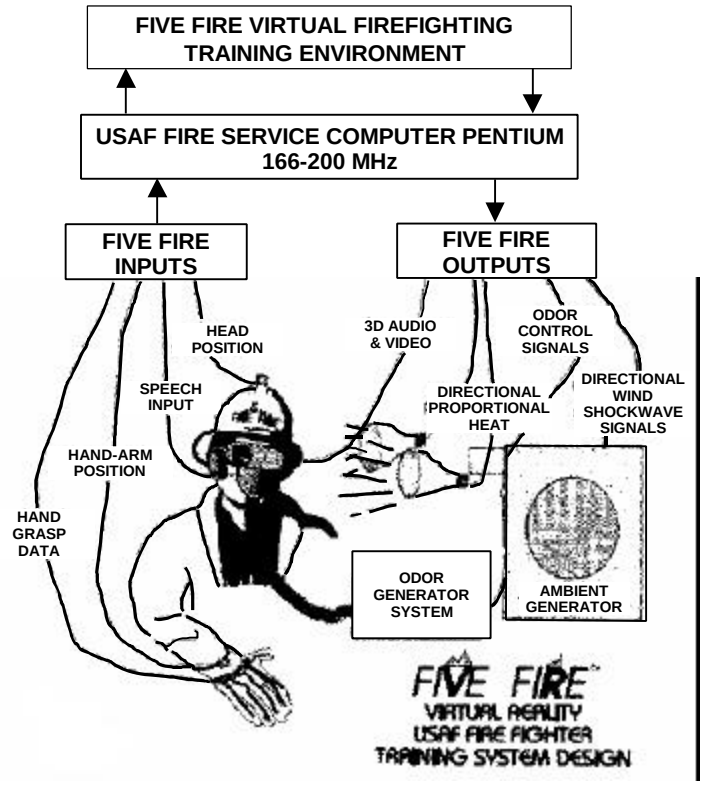
Actual fire emergencies can be extremely dangerous without proper training

THE GOAL

This effort develops the next generation firefighter training system. The research focuses on future state-of-the-art virtual reality training technologies to provide economical, environmentally safe, measurable, repeatable, and challenging performance-based emergency services training.

THE APPROACH

The system will consist of computer-generated imagery and scenario inputs integrated with a modified fire growth and decay model. Firefighter performance will be tracked through position and motion sensors. Sensory cues will include 3-D audio and video; ambiance, olfactory, and radiant heat. Physical dynamics of system integration will include high-risk scenario development, fire modeling, and real-time graphics rendering. Sensory and behavioral skills will be enhanced through motor skill development and physiological interfaces.



The firefighter (dressed in normal firefighter garments and equipped with a special face mask, helmet-mounted display, and motion sensors) will be placed within a 10-foot Octodeck chamber. The firefighter will receive input, react, and be monitored throughout the training scenario.

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